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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 09/931,316 | 08/16/2001 | Upendra V. Chaudhari | YOR920010425US1 (590.072) | 3719 |
| 35195 7590 01/29/2007 FERENCE & ASSOCIATES 409 BROAD STREET PITTSBURGH, PA 15143 | | | EXAMINER LERNER, MARTIN | |
| | | | ART UNIT 2626 | PAPER NUMBER |
| SHORTENED STATUTORY PERIOD OF RESPONSE | | | MAIL DATE | DELIVERY MODE |
| 3 MONTHS | | | 01/29/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

09/931,316

Applicant(s)

CHAUDHARI ET AL.

Examiner

Martin Lerner

Art Unit

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 to 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 to 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1 to 21 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Independent claims 1, 11, and 21 are directed to non-statutory subject matter because they set forth only abstract mathematic elements, without relation to anything in the real world, and do not produce a useful, concrete, and tangible result. See MPEP 2106. The independent claims are not directed to, and do not operate on, any physical thing, e.g. speech samples, nor are they drawn to a concrete application, e.g. a speech recognition system or a speaker recognition system. "A classification system, "Gaussian mixture models", "at least one derived function", "a global model", and "a target model" are all merely abstract mathematical entities. Thus, Applicants' method does not produce any concrete and tangible result, nor is it tied to any real world application, as it is directed only to manipulation of abstract mathematical quantities.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1 to 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Independent claims 1, 11, and 21 are misdescriptive insofar as they do not correctly set forth the interrelationships of the elements set forth by the Specification. Applicants' Specification provides several individual descriptions of the invention, but the independent claims, as amended, do not properly correlate the steps of the individual descriptions.

Firstly, it does not appear that the step of providing a classification system including at least one structural parameter is distinct from the step of utilizing Gaussian mixture models for representing a global model. It is maintained that the Gaussian mixture models represent the major element of the classification system, and are defined by structural parameters including a likelihood of an utterance given a model. Thus, the step of providing a classification system should be merged with utilizing Gaussian mixture models. It is misdescriptive to suggest that structural parameters preexist the Gaussian mixture models, as the order of claiming would imply.

Secondly, the scope of the claimed element, "at least one derived function", is not well defined, so that "at least one derived function" is not well described by the Specification. The Specification describes several functions that could qualify as "at least one derived function" – a likelihood ratio between the target and world model

(Page 5), an average likelihood (Pages 5 and 6), a discriminant function (Page 6), and a function of the likelihoods on the selected model set (Pages 7 and 8). Applicants should clarify where the "at least one derived function" is described by the Specification.

Apparently, "at least one derived function" may be a function of the likelihoods, and can be a linear function $f(x) = x$ or a rank function, described in the Specification, Pages 7 and 8, Steps 4 and 5. However, Applicants should confirm that functions of the likelihoods are "at least one derived function".

Thirdly, it does not appear that adapting the classification system is distinct from the step of selecting a model set from the global model set. Applicants' Specification, Pages 7 to 8, Step 5, discloses that the new parametric model is obtained from adaptation data by selecting one or more mixture components from a Gaussian mixture model to obtain a new model through, e.g., the function $f(x) = x$. Thus, the step of adapting the classification system should be merged with the step of selecting a model set. It is misdescriptive to suggest that they are distinct steps.

Claims 1 to 21 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for adaptation of a classification system for speech recognition, speaker recognition, and speech verification, does not reasonably provide enablement for adaptation of any classification system. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Applicants' Specification only discloses adaptation of a classification system directed to speech recognition, speaker recognition, and speech verification. Thus, claiming a method, apparatus, and program storage device for adapting any classification system may be broader than the scope of disclosure. Here, it would involve undue experimentation to adapt any classification system when only adaptation of a classification system for speech recognition, speaker recognition, and speech verification is disclosed by the Specification, as doing so would involve undue experimentation under *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988). The factors for undue experimentation are set forth by MPEP 2164.01(a):

2164.01(a) Undue Experimentation Factors

There are many factors to be considered when determining whether there is sufficient evidence to support a determination that a disclosure does not satisfy the enablement requirement and whether any necessary experimentation is "undue."

These factors include, but are not limited to:

- (A) The breadth of the claims;
- (B) The nature of the invention;
- (C) The state of the prior art;
- (D) The level of one of ordinary skill;
- (E) The level of predictability in the art;
- (F) The amount of direction provided by the inventor;
- (G) The existence of working examples; and

(H) The quantity of experimentation needed to make or use the invention based on the content of the disclosure.

Independent claims 1, 11, and 21 fail to be enabling for commensurate scope due to a number of these factors. Applicants have disclosed no working examples for any adaptation of a classification system other than directed to speech. The independent claims are broader than the scope of the Specification, which is directed only to adaptation of a speech or speaker recognition system. Moreover, one skilled in the art could not readily predict that the method of adaptation of models for speech would be readily applicable to other classification systems. Finally, no applications to other classification systems are disclosed or suggested by Applicants' Specification.

Response to Arguments

Applicants' arguments have been considered but are moot in view of the new grounds of rejection, necessitated by amendment.

Conclusion

The prior art made of record and not relied upon is considered pertinent to Applicants' disclosure.

Burges, Rahim, Kuhn et al., Farrell et al., Sejnoha, and Maes disclose related art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (571) 272-

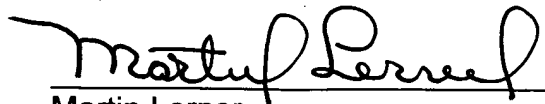
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7608. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ML
1/22/07


Martin Lerner
Examiner
Group Art Unit 2626